

Trend Study 22R-4-03

Study site name: Above Fremont Wash.

Vegetation type: Wyoming Big Sagebrush.

Compass bearing: frequency baseline 293 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

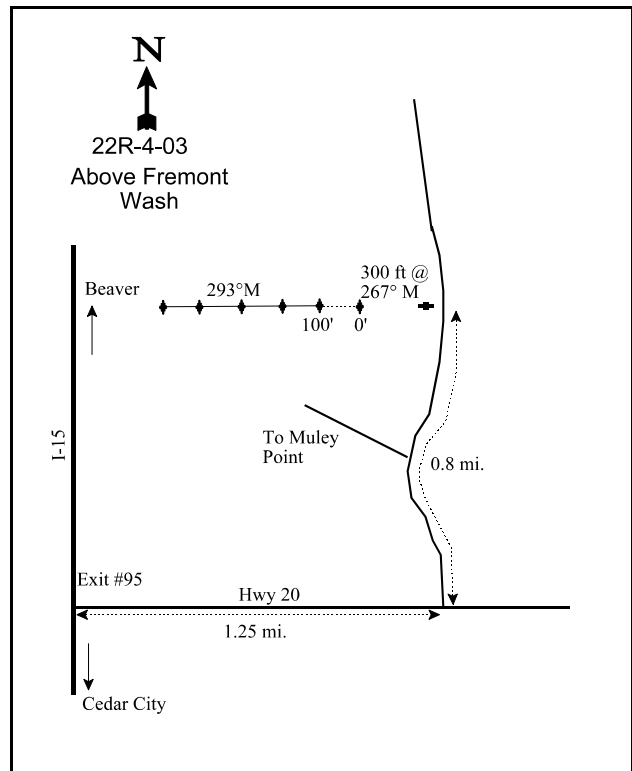
LOCATION DESCRIPTION

South of Beaver on I-15 take exit # 95. Drive 1.25 miles east on Highway 20 to a road going north (left side of the road). Drive 0.8 miles to the witness post (the road to the Muley Point site will be past on the way). From the witness post, walk 300 feet at 267 degrees magnetic to the 0' stake. The 0' stake is marked by browse tag #406.



Map name: Buckhorn Flat

Township 31S, Range 7W, Section 33



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4214896 N 354393 E

DISCUSSION

Above Fremont Wash - Trend Study No. 22R-4

This study was established in 1999 to monitor critical deer winter range east of Interstate 15 and north of Highway 20. This transect is just east of transect 22-8 (Muley Point), but is slightly higher in elevation. The site is moderately steep (20-25%) and slopes to the southwest at an elevation of 6,400 feet. The range type is Wyoming big sagebrush-grass with scattered pinyon and juniper. Deer use on this site has been moderately high as evidenced by pellet group transect data collected on site in 1999 and 2003. Deer use was estimated at 73 days use/acre (180 ddu/ha) in 1999 and 62 days use/acre (152 ddu/ha) in 2003.

Soils are loam in texture and have a neutral pH (6.8). Soil depth is moderate with an effective rooting depth estimated at over 11 inches. Rock and pavement are abundant on the surface and throughout the upper layers of the soil profile. Erosion has not been severe during either reading, but some sign of overland flow was apparent in 1999. The abundance of rock and pavement on the surface and relatively low amounts of bare ground hint that erosion was moderate in the past. An erosion condition class assessment completed on site in 2003 rated soils as stable.

Wyoming big sagebrush is the key browse on the site. Density was estimated at 2,680 plants/acre in 1999 and 2,800 in 2003. This population consists almost entirely of mature and decadent plants with low reproduction in both surveys. The decadence rate was moderate in both 1999 and 2003 at 23% and 30% respectively, while the young age class made up 3% and 1% of the total population in the same years. Utilization on sagebrush was moderate to heavy in both 1999 and 2003, but the majority of the population has maintained normal vigor. Annual sagebrush leader growth had averaged 1.5 inches by June of 2003. Seed production was moderate. Other browse sampled on the site include broom snakeweed, and several cactus species. Point-center quarter data collected in 2003 estimated 31 pinyon and 17 juniper trees/acre on the site.

The herbaceous component is dominated by grasses. Cheatgrass was the dominant species in both 1999 and 2003 as it provided 61% and 82% of the grass cover in those years respectively. In 2003, cheatgrass made up 60% of the total vegetation cover on the site, was sampled in every quadrat, and almost doubled in average cover over 1999 estimates. This site has an obvious competition and fire hazard problem due to the abundance of cheatgrass. A fire would eliminate the key browse, Wyoming big sagebrush, and have a detrimental effect to the wintering deer herds in the area. The abundance of cheatgrass also creates a highly competitive environment for perennial grass and forb species as well as sagebrush. Cheatgrass dries out the upper layers of the soil profile early in the summer and makes it very difficult for the seedling and young plants of other species to acquire water and nutrients during the hot dry summer months. Perennial grasses have only fair abundance on this site. Warm season species include blue grama, galleta, and sand dropseed, while cool season species are represented by Indian ricegrass, bottlebrush squirreltail, and needle-and-thread grass. Sum of nested frequency for all perennial grasses combined is about half of the value of cheatgrass alone. Forbs are scarce. Annual species increased between 1999 and 2003, while perennials remained stable.

1999 APPARENT TREND ASSESSMENT

Trend for soil appears to be stable. Bare ground is low, while rock and pavement cover armor the soil surface. Vegetation and litter cover are moderately abundant and help minimize erosion. The browse component appears stable. The Wyoming big sagebrush population has moderate decadence (23%), low reproduction, and is dominated by mature plants. Use on sagebrush is moderate to heavy. The herbaceous component appears to be downward due to the dominance of cheatgrass. Perennial grasses have fair abundance, but all species combined, are less abundant in nested frequency and cover than cheatgrass alone. Forbs are scarce and insignificant in the vegetative community.

2003 TREND ASSESSMENT

Trend for soil is stable. Bare ground has only slightly increased since 1999. Vegetation cover also increased due to the abundance of cheatgrass, and rock and pavement are abundant and armor the soil surface. Erosion is low. Trend for browse is stable. Wyoming big sagebrush slightly increased in density and still displays moderate to heavy use. Reproduction declined but was already very low in 1999. Vigor improved somewhat in 2003, and percent decadence slightly increased to 30%. The main positive change with sagebrush in 2003 was the decrease in the proportion of the decadent age class classified as dying (81% to 21%). Trend for the herbaceous understory is stable but remains dominated by cheatgrass. Cheatgrass declined in nested frequency, but nearly doubled in average cover and poses a serious fire hazard for the site and surrounding area. Sum of nested frequency for perennial grasses and forbs remained stable between 1999 and 2003.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Management unit 22R, Study no: 4

Type	Species	Nested Frequency		Average Cover %	
		'99	'03	'99	'03
G	Agropyron spicatum	-	-	-	.00
G	Aristida purpurea	-	4	-	.06
G	Bouteloua gracilis	46	70	1.49	2.13
G	Bromus tectorum (a)	_b 453	_a 410	13.05	23.11
G	Hilaria jamesii	-	5	-	.06
G	Oryzopsis hymenoides	50	47	2.12	1.17
G	Sitanion hystrix	_a 1	_b 34	.00	.42
G	Sporobolus cryptandrus	_b 99	_a 38	4.73	1.00
G	Stipa comata	6	3	.06	.04
G	Vulpia octoflora (a)	_a -	_b 22	-	.06
Total for Annual Grasses		453	432	13.05	23.18
Total for Perennial Grasses		202	201	8.41	4.92
Total for Grasses		655	633	21.47	28.10
F	Collinsia parviflora (a)	_a -	_b 11	-	.02
F	Descurainia pinnata (a)	_a -	_b 8	-	.02
F	Draba spp. (a)	-	3	-	.00
F	Eriogonum cernuum (a)	2	1	.00	.00
F	Erigeron eatonii	3	1	.00	.00
F	Gilia spp. (a)	_a -	_b 49	-	.23
F	Lappula occidentalis (a)	-	1	-	.00
F	Leucelene ericoides	-	4	-	.03

T y p e	Species	Nested Frequency		Average Cover %	
		'99	'03	'99	'03
F	Microsteris gracilis (a)	_a -	_b 12	-	.03
F	Phlox austromontana	-	5	-	.00
F	Sphaeralcea coccinea	17	10	.10	.14
Total for Annual Forbs		2	85	0.00	0.32
Total for Perennial Forbs		20	20	0.10	0.18
Total for Forbs		22	105	0.10	0.51

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 22R, Study no: 4

T y p e	Species	Strip Frequency		Average Cover %	
		'99	'03	'99	'03
B	Artemisia tridentata wyomingensis	65	70	3.74	8.21
B	Echinocereus spp.	0	1	-	-
B	Gutierrezia sarothrae	0	1	-	-
B	Juniperus osteosperma	0	0	.15	.15
B	Opuntia whipplei	10	13	1.41	1.85
B	Pinus edulis	0	0	.03	-
Total for Browse		75	85	5.33	10.21

CANOPY COVER, LINE INTERCEPT --

Management unit 22R, Study no: 4

Species	Percent Cover	
	'99	'03
Artemisia tridentata wyomingensis	-	8.19
Echinocereus spp.	-	.15
Juniperus osteosperma	.80	.80
Opuntia whipplei	-	1.50

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 22R, Study no: 4

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	1.5

POINT-QUARTER TREE DATA --
Management unit 22R, Study no: 4

Species	Trees per Acre	
	'99	'03
Juniperus osteosperma	31	17
Pinus edulis	31	31

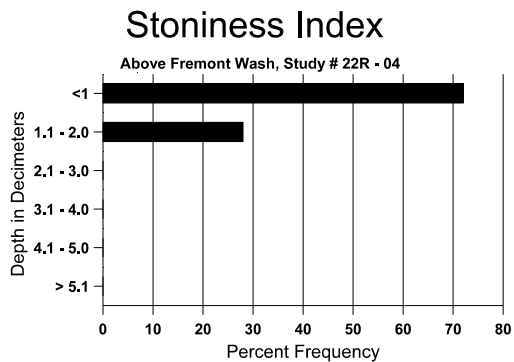
Average diameter (in)	
'99	'03
10.0	10.4
3.0	4.0

BASIC COVER --
Management unit 22R, Study no: 4

Cover Type	Average Cover %	
	'99	'03
Vegetation	32.45	40.91
Rock	18.97	15.79
Pavement	13.86	19.65
Litter	30.85	24.50
Cryptogams	.48	.01
Bare Ground	9.31	10.57

SOIL ANALYSIS DATA --
Management unit 22R, Study no: 4, Study Name: Above Fremont Wash

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
11.6	70.7 (8.8)	6.8	42.0	34.7	23.3	1.7	7.1	147.2	0.5



PELLET GROUP DATA --

Management unit 22R, Study no: 4

Type	Quadrat Frequency		Days use per acre (ha)	
	'99	'03	'99	'03
Rabbit	27	17	-	-
Deer	21	27	73 (180)	62 (152)
Cattle	-	1	-	1 (3)

BROWSE CHARACTERISTICS --

Management unit 22R, Study no: 4

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<i>Artemisia tridentata wyomingensis</i>											
99	2680	20	80	1980	620	820	31	53	23	19	17/26
03	2800	-	40	1920	840	620	41	58	30	6	18/26
<i>Echinocereus</i> spp.											
99	0	-	-	-	-	-	0	0	-	0	-/-
03	20	-	-	20	-	-	0	0	-	0	5/14
<i>Gutierrezia sarothrae</i>											
99	0	-	-	-	-	-	0	0	-	0	-/-
03	40	-	-	40	-	-	0	0	-	0	6/5
<i>Opuntia polyacantha</i>											
99	0	-	-	-	-	-	0	0	-	0	-/-
03	0	-	-	-	-	-	0	0	-	0	6/22
<i>Opuntia whipplei</i>											
99	240	-	-	240	-	-	0	0	-	0	15/33
03	280	-	20	260	-	-	0	0	-	0	16/36